

Appl. No. 09/735,574
 Amdt. dated September 22, 2006
 Response to Notice of Allowance August 3, 2006

PATENT

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended) A computer implemented method for calculating a normalization factor comprising:

providing a first intensity value ($I^{(1)}$) of a probe in a first probe array and a second intensity value ($I^{(2)}$) of said probe in a second probe array, wherein the intensity values are referential intensity values that indicate nucleic acid hybridization;

obtaining the geometric mean (x) of said $I^{(1)}$ and said $I^{(2)}$;

calculating said normalization factor according to:

$f(x) = e^{h(x)}$, wherein said $h(x)$ is derived from the referential intensities intensity values from said first and second probe arrays; and

using said normalization factor for gene expression analysis and outputting the result of said analysis.
2. (original) The method of Claim 1 wherein said $h(x)$ is derived by relating geometric means (x_i) of first referential intensities ($RI_i^{(1)}$) in the first probe array and second referential intensities ($RI_i^{(2)}$) in the second probe array to:

$$y_i = \log \left(\frac{RI_i^{(1)}}{RI_i^{(2)}} \right).$$
3. (original) The method of Claim 2 wherein said relating comprising:

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sorting (x_i, y_i) pairs according to x_i into a plurality (m number) of bins with no overlapping;

computing medians (\bar{x}_k) of x_i 's and medians (\bar{y}_k) of y_i 's for each bin; and

interpolating said medians (\bar{x}_k, \bar{y}_k) .

4. (original) The method of Claim 3 wherein said bins are of approximately equal size.

5. (original) The method of Claim 4 wherein said $h(x)$ is:

$$h(x) = \begin{cases} \bar{y}_1, & \text{if } x \leq \bar{x}_1 \\ w\bar{y}_i + (1-w)\bar{y}_{i+1}, & \text{if } x \in (\bar{x}_i, \bar{x}_i + 1), w = \frac{\bar{x}_i + 1 - x}{\bar{x}_i + 1 - \bar{x}_i}, i = 1, \dots, m-1, \\ \bar{y}_m, & \text{if } x > \bar{x}_m \end{cases}$$

6. (original) The method of Claim 5 wherein said m is 3.

7. - 13. (canceled)

14. (currently amended) A system for calculating a normalization factor comprising:

a processor; and

a memory coupled with the processor, the memory storing a plurality of machine instructions that cause the processor to perform a plurality of logical steps when implemented by the processor, the logical steps comprising:

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providing a first intensity value ($I^{(1)}$) of a probe in a first probe array and a second intensity value ($I^{(2)}$) of said probe in a second probe array, wherein the intensity values are referential intensity values that indicate nucleic acid hybridization;

obtaining the geometric mean (x) of said $I^{(1)}$ and said $I^{(2)}$;

calculating said normalization factor according to:

$f(x) = e^{h(x)}$, wherein said $h(x)$ is derived from the referential intensities intensity

values from said first and second probe arrays; and

using said normalization factor for gene expression analysis and outputting the result of said analysis.

15. (original) The system of Claim 14 wherein said $h(x)$ is derived by relating geometric means (x_i) of first referential intensities ($RI_i^{(1)}$) in the first probe array and second referential intensities ($RI_i^{(2)}$) in the second probe array to:

$$y_i = \log \left(\frac{RI_i^{(1)}}{RI_i^{(2)}} \right).$$

16. (original) The system of Claim 15 wherein said relating comprising: sorting (x_i, y_i) pairs according to x_i into a plurality (m number) of bins with no overlapping;

computing medians (\bar{x}_k) of x_i 's and medians (\bar{y}_k) of y_i 's for each bin; and

interpolating said medians (\bar{x}_k, \bar{y}_k).

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17. (original) The system of Claim 16 wherein said bins are of approximately equal size.

18. (original) The system of Claim 17 wherein said $h(x)$ is:

$$h(x) = \begin{cases} \bar{y}_1, & \text{if } x \leq \bar{x}_1 \\ w\bar{y}_1 + (1-w)\bar{y}_{i+1}, & \text{if } x \in (\bar{x}_i, \bar{x}_i + 1), w = \frac{\bar{x}_i + 1 - x}{\bar{x}_i + 1 - \bar{x}_i}, i = 1, \dots, m-1, \\ \bar{y}_m, & \text{if } x > \bar{x}_m \end{cases}$$

19. (original) The system of Claim 18 wherein said m is 3.

20. - 26. (canceled)

27. (currently amended) A computer software product for calculating a normalization factor comprising:

computer program code for providing a first intensity value ($I^{(1)}$) of a probe in a first probe array and a second intensity value ($I^{(2)}$) of said probe in a second probe array, wherein the intensity values are referential intensity values that indicate nucleic acid hybridization;

computer program code for obtaining the geometric mean (x) of said $I^{(1)}$ and said $I^{(2)}$;

computer program code for calculating said normalization factor according to:

$f(x) = e^{h(x)}$, wherein said $h(x)$ is derived from the referential ~~intensities~~ intensity values from said first and second probe arrays; and

computer program code for using said normalization factor for gene expression analysis and outputting the result of said analysis; and

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a computer readable medium for storing said codes.

28. (original) The computer software product of Claim 27 wherein said $h(x)$ is derived by relating geometric means (x_i) of first referential intensities ($RI_i^{(1)}$) in the first probe array and second referential intensities ($RI_i^{(2)}$) in the second probe array to:

$$y_i = \log \left(\frac{RI_i^{(1)}}{RI_i^{(2)}} \right).$$

29. (original) The computer software product of Claim 28 wherein said code for relating comprising:

computer program code for sorting (x_i, y_i) pairs according to x_i into a plurality (m number) of bins with no overlapping;

computer program code for computing medians (\bar{x}_k) of x_i 's and medians (\bar{y}_k) of y_i 's for each bin; and

computer program code for interpolating said medians (\bar{x}_k, \bar{y}_k).

30. (original) The computer software product of Claim 29 wherein said bins are of approximately equal size.

31. (original) The computer software product of Claim 30 wherein said $h(x)$ is:

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$$h(x) = \begin{cases} \bar{y}_1, & \text{if } x \leq \bar{x}_1 \\ w\bar{y}_i + (1-w)\bar{y}_{i+1}, & \text{if } x \in (\bar{x}_i, \bar{x}_i + 1), w = \frac{\bar{x}_i + 1 - x}{\bar{x}_i + 1 - \bar{x}_1}, i = 1, \dots, m-1, \\ \bar{y}_m, & \text{if } x > \bar{x}_m \end{cases}$$

32. (original) The computer software product of Claim 31 wherein said m is 3.

33. - 39. (canceled)